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NOTICE OF THE NAMING AND RELEASE  
OF  
'HOBBLE CREEK' MOUNTAIN BIG SAGEBRUSH (ARTEMISIA TRIDENTATA SSP. VASEYANA)

FOR  
USE ON MULE DEER AND DOMESTIC SHEEP WINTER RANGES

BY THE

UTAH AGRICULTURAL EXPERIMENT STATION - UTAH STATE UNIVERSITY  
AND THE  
UNITED STATES DEPARTMENT OF AGRICULTURE -  
FOREST SERVICE - INTERMOUNTAIN RESEARCH STATION  
AND THE  
UTAH STATE DIVISION OF WILDLIFE RESOURCES  
AND THE  
UPPER COLORADO ENVIRONMENTAL PLANT CENTER  
AND THE  
COLORADO AGRICULTURAL EXPERIMENT STATION - COLORADO STATE UNIVERSITY  
AND THE  
IDAHO AGRICULTURAL EXPERIMENT STATION - UNIVERSITY OF IDAHO  
AND THE  
UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

The Utah Agricultural Experiment Station - Utah State University, United States Department of Agriculture - Forest Service - Intermountain Research Station, Utah State Division of Wildlife Resources, Upper Colorado Environmental Plant Center, Colorado Agricultural Experiment Station - Colorado State University, Idaho Agricultural Experiment Station - University of Idaho, and the United States Department of Agriculture - Soil Conservation Service announce the naming and release of 'Hobble Creek' mountain big sagebrush (Artemisia tridentata ssp. vaseyana) for commercial production and marketing of seed and plants. Of 186 big sagebrush strains tested, 'Hobble Creek' is the most preferred by wintering mule deer and ranks high in preference by wintering domestic sheep. What follows is a general description of the 'Hobble Creek' selection. Details are given in the publication: Welch, B. L., E. D. McArthur, D. L. Nelson, J. C. Pederson, and J. N. Davis. 1986. 'Hobble Creek'--A superior selection of low-elevation

mountain big sagebrush. USDA, Forest Service, Intermountain Research Station, Ogden, Utah, Research Paper INT-370. p. 10.

Origin: Mr. A. Perry Plummer discovered the selection in 1968 at the mouth of Hobble Creek drainage just east of Springville, UT. A breeder block was established by Dr. Bruce L. Welch in 1980 from which all breeder seed was obtained. To protect the breeder block from wintering mule deer use, a deer proof fence was constructed in 1984. The breeder block is located at the mouth of Hobble Creek drainage (Section 36, T75, R3E).

Description: 'Hobble Creek' mountain big sagebrush is taxonomically a form of Artemisia tridentata Nutt (big sagebrush). Big sagebrush is a highly polymorphic species with numerous ecotypes and biotypes. Currently, four subspecies are recognized. These are A. t. ssp. tridentata - basin big sagebrush, A. t. ssp. wyomingensis - Wyoming big sagebrush, and A. t. ssp. vasevana - mountain big sagebrush, and A. t. ssp. spiciformis - spikate big sagebrush (McArthur et al. 1979, Goodrich et al. 1985).

'Hobble Creek' is a mountain big sagebrush. 'Hobble Creek' is normally a smaller plant than basin big sagebrush but larger than Wyoming big sagebrush. Mature height for 'Hobble Creek' is 1.0 to 1.2 meters, ranking as one of the taller mountain big sagebrushes (McArthur and Welch 1982). Vegetative production, expressed as the weight of current years leaves and stems per cm, of 'Hobble Creek' is .382 grams per cm. This value is among the highest for mountain big sagebrushes and is heavier than most basin big sagebrushes (Davis and Stevens 1986). Its main stem is usually divided at or near the ground, and the plants tend to have a spreading, flat top crown. 'Hobble

'Creek' persistent vegetative leaves are broadly cuneate to spatulate and are wider than those of both basin and Wyoming big sagebrush. Persistent leaves are  $17.3 \pm 3.1$  mm long and  $5.2 \pm 1.5$  mm wide.

Crushed leaves emit a strong camphorlike fragrance. This fragrance is due to the chemical make up of 'Hobble Creek' monoterpenoids (essential or volatile oils). Total winter monoterpenoid content of 'Hobble Creek' is about 2.09 percent of dry matter. This level is about midrange for other selections of big sagebrush. The winter 'Hobble Creek' profile consists of **six** monoterpenoids; camphene -- at about 0.05% of dry matter, 1, 8 cineol -- about 0.6%, camphor -- about 1.15%, Beta-thujone -- about 0.10%, Fenchyl alcohol -- about 0.02%, and unknown -- about 0.17%. Pinene is a seventh monoterpenoid that can be found at low levels during other seasons of the year (Cedarleaf et al. 1983). This monoterpenoid profile is characteristic of 'Hobble Creek' and can be used to identify the selection (Welch and McArthur 1981).

'Hobble Creek' starts to flower late July to early August. Seeds which are achenes are mature around the first of December. This selection is one of the latest maturing big sagebrush known to us. The seeds are small. About 1.36 million seeds are needed to make a pound. An acre of wildland (14 to 18 inches of precipitation) 'Hobble Creek' produces about 300 pounds of seed at 10 percent purity. Higher seed yield probably could be obtained through irrigation and fertilization.

The Need: On mule deer (Odocoileus hemionus hemionus) and domestic sheep (~~Ovis aries~~) winter ranges, forages are deficient for four nutrients. These

nutrients are energy-producing compounds, protein, phosphorus, and carotene. Forages which supply these nutrients at or above the maintenance requirement would help to overcome the deficiencies. One species of range plants that can supply the four nutrients at or above the maintenance requirement of wintering mule deer and sheep is big sagebrush. Big sagebrush not only can increase the nutrient level of winter diets, but is a more dependable forage source during periods of drought than are other shrubs, forbs, or grasses.

It is, in part, the evergreen nature of big sagebrush that gives it a winter nutritional advantage over deciduous shrubs such as bitterbrush (Purshia tridentata), true mountain-mahogany (Cercocarpus montanus), and most herbaceous species. Big sagebrush usually remains available for use above the snow while the other forage classes become covered and unavailable for wintering animals (Gade and Provenza 1986). However, not all big sagebrush selections are eaten or even equally preferred by wintering animals.

The Nutritive Profile: The 'Hobble Creek' selection is preferred over other selections of big sagebrush by wintering mule deer and was ranked in the most preferred group by wintering domestic sheep. This high degree of preference is the main justification for claiming it as a superior selection of big sagebrush.

'Hobble Creek' ranked in the top third of all selections test for productivity (length of leader growth) and was ranked third out of 20 selections in vegetative production expressed on a gram per centimeter of stem basis (Davis and Stevens 1986). Winter nutritive content of vegetative tissue is: (1) in vitro digestibility--52.6 percent of dry matter, (2)

crude protein--11.0 percent of dry matter, (3) phosphorus--0.21 percent of dry matter, and (4) many times above the maintenance requirement for carotene. Also, 'Hobble Creek' lacks compounds that suppress in vitro grass cell wall digestion.

Areas Where It Can Be Grown: 'Hobble Creek' can be grown on sites with the following physical characteristics:

1. Mean annual precipitation of 14 or more inches. This is on the low end of the range for mountain big sagebrush.
2. Deep, well-drained soils with an effective rooting depth of at least 4 feet.
3. Soil no finer than a clay loam (40 percent clay or less). On sites with heavy clay soils 'Hobble Creek' appears to be predisposed to root rot and vascular wilt type pathogens.
4. Soil pH between 6.6 and 8.6.
5. Growing season of 90 days or more.

We do not recommend trying to establish 'Hobble Creek' in Wyoming big sagebrush sites because of shallow soils and low precipitation.

'Hobble Creek' can be established on suitable sites by direct seeding, by transplanting bare-root or containerized stock, and by the mother plant technique.

Seed Source: Breeder seed will be maintained at the breeder block by the Intermountain Research Station, Shrub Sciences Laboratory, Provo, Utah.